

# COMPETITION POLICY FOR INNOVATION

Based on *Innovation Matters: Competition Policy  
for the High-Technology Economy*  
Forthcoming MIT Press

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# Outline

Merger effects for innovation and future price competition

- Theory

- Empirical evidence

Single firm conduct for innovation

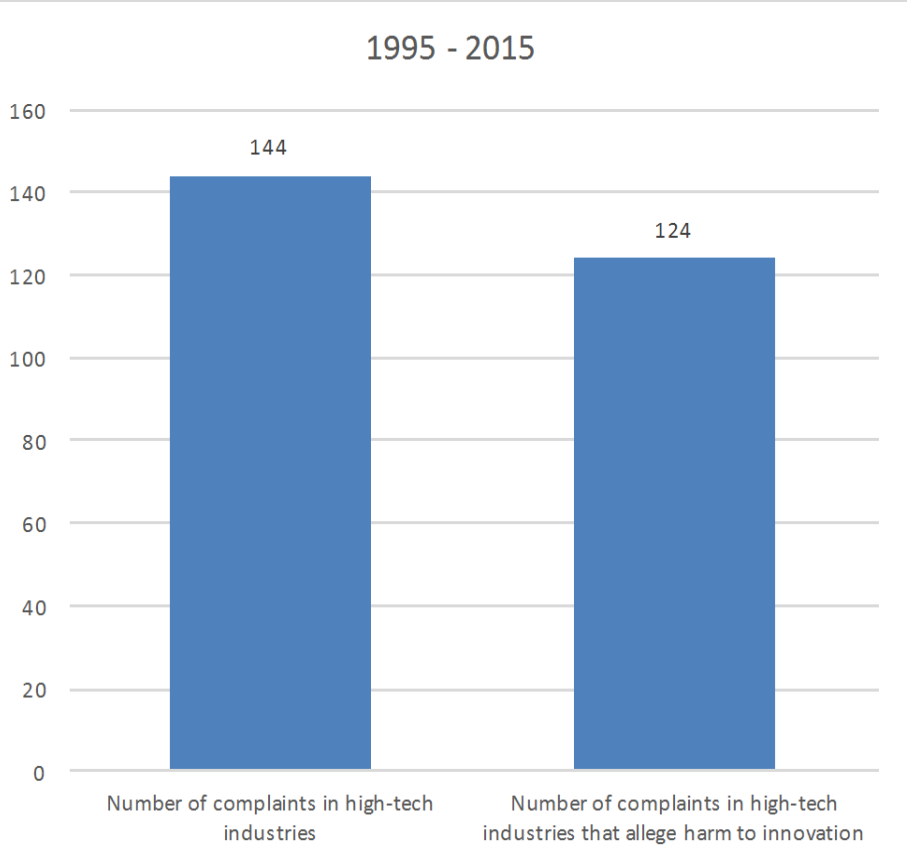
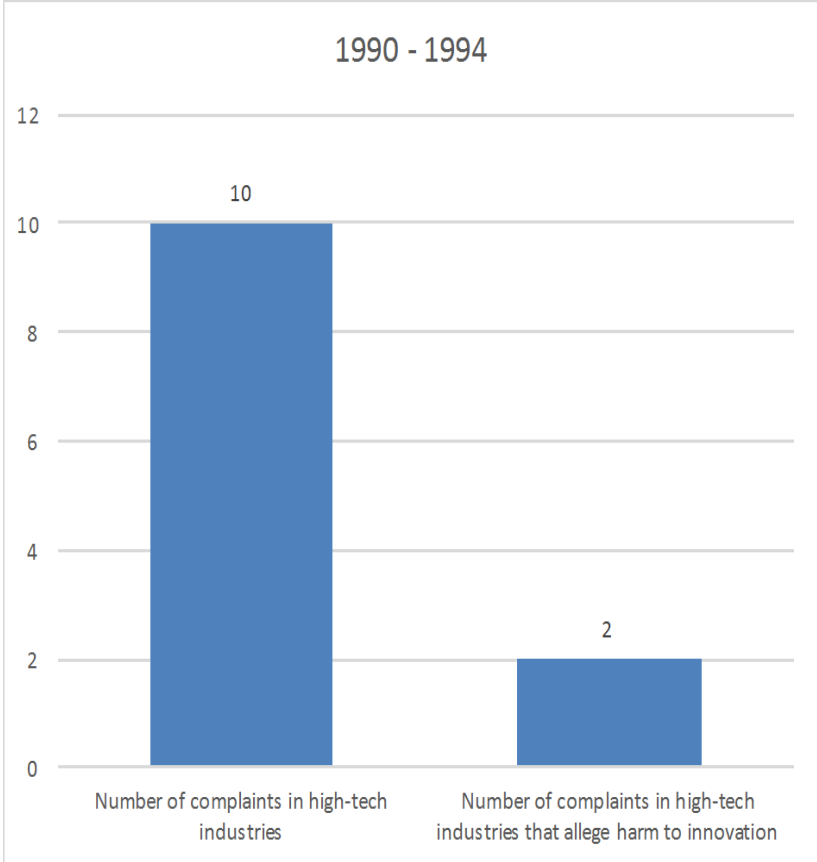
- Tests for “predatory innovation” and related anticompetitive conduct

# Horizontal Mergers

Horizontal mergers can adversely affect competition by:

- Lessening competition for products or services that firms currently sell (existing product markets)
- Lessening competition for new products (future product markets)
- Lessening incentives to develop new or improved products (innovation)

# Innovation Allegations Are Common



# Allegations Rarely Turn On Innovation

No case has been litigated in the US or Europe for which innovation allegations determine enforcement outcomes

But there is cause for concern about innovation effects

Diversion

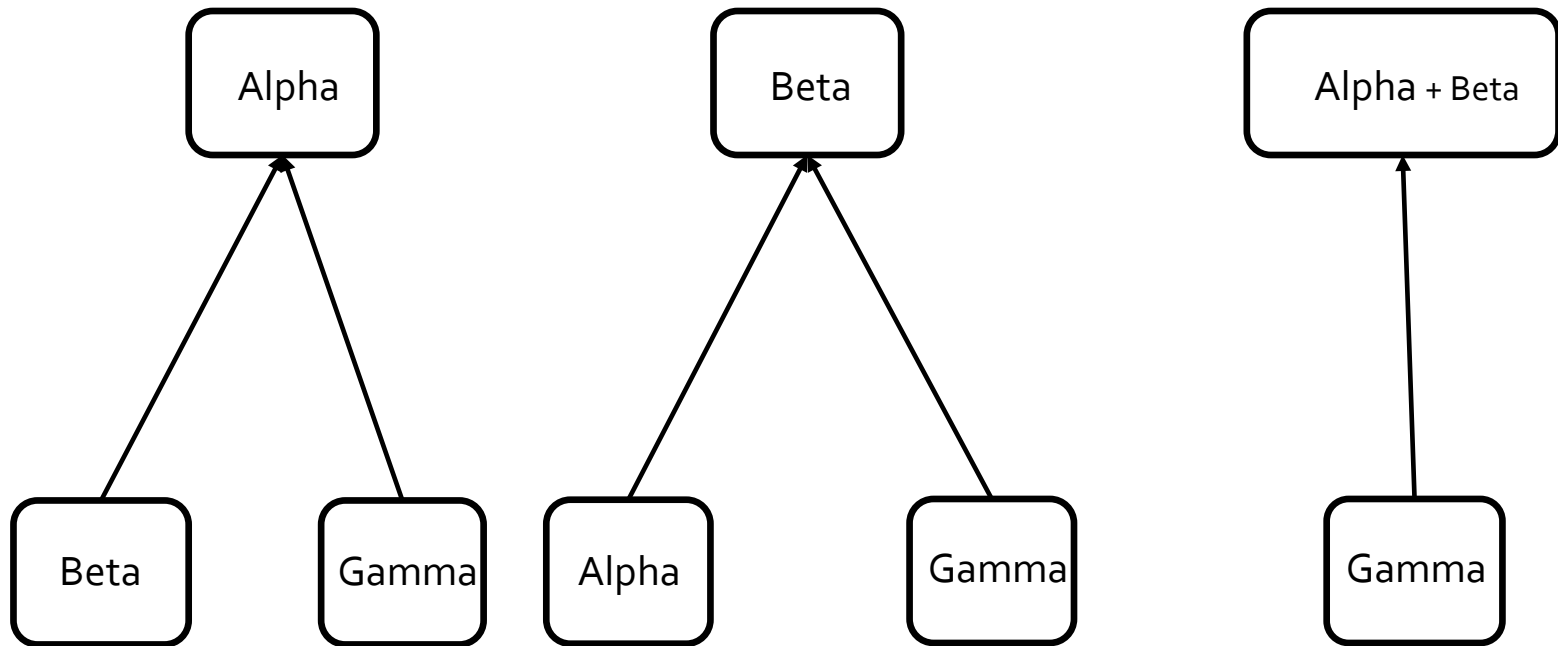
Arrow replacement effect (intra-firm diversion)

And there is cause for concern about affects for competition in markets for future products and services

# Diversion: 3 to 2 Merger

Pre-Merger

Post-Merger



Pre-merger, the merging parties (Alpha and Beta) have incentives to take business away from Gamma and from each other. Post-merger, they can only take business away from Gamma.

# Prevailing Beliefs

- Diversion causes a “significant impediment to innovation competition”. Hence mergers of firms engaged in R&D in the same field are presumptively anticompetitive
- Schumpeter: appropriation effects imply that concentrated markets promote innovation
- Empirical evidence demonstrates that competition promotes productivity. Hence mergers harm innovation
- Empirical evidence on competition and innovation is useless because mergers are not equivalent to a reduction in competition (“dangerous literature”)

# Prevailing Beliefs Are Flawed Because:

Simple models of diversion do not capture effects from inter-firm and intra-firm spillovers, technological asymmetries, and dynamics

Productivity is not the same as innovation. Competition increases productivity through a Darwinian selection effect and re-allocation of production to more efficient plants

Empirical evidence on competition and innovation illustrates the importance of technological asymmetries. Furthermore, merging firms can reposition R&D assets, which makes a merger more like a reduction in the number of rivals



# Some Other Issues For Mergers In Hi-Tech Industries

Price effects for future products can be at least as significant as innovation harms

Acquisitions can “kill” nascent competitors  
but acquisition is often an incentive for  
innovation

Mergers can reduce innovation incentives through the Arrow “replacement effect” even if merger combines products that are not substitutes for each other

# Empirical Studies: Mergers

Only a few studies specifically address the effects of mergers on innovation

Of those that do, many fail to account for differences in merging and non-merging firms, which introduces an important source of bias

Empirical studies find some evidence of innovation harm from mergers

But observations are censored by merger enforcement and we don't observe mergers that were not permitted

Nonetheless, empirical studies do not support a conclusion that mergers promote innovation

# Mergers That May Harm Innovation

## Product-to-project merger

A firm with an existing product that merges with or acquires another firm that has an R&D project which, if it is successful, would compete with the other firm's product

## Project-to-project merger

Merging firms have projects in their R&D pipelines directed to similar applications

## Overlapping R&D capabilities merger

Merger of firms with R&D capabilities that can be directed to similar applications but the merging firms have no identified competitive R&D projects

# Merger Enforcement Decision: General Principles

Merger has benefits (G) or harm (H)

Merger investigation generates information  $\theta$

Enforcement cost,  $K$

Challenge the merger if

$$HP(H|\theta) - K > GP(G|\theta) \quad (1)$$

# Merger Enforcement Decision: General Principles

Bayes Rule with  $x = H, G$

$$P(x|\theta) = \frac{P(\theta|x)P(x)}{P(\theta)} \quad (2)$$

If  $K = 0$ , from (1) and (2), antitrust authority should challenge the merger if

$$\frac{P(\theta|H)}{P(\theta|G)} > \frac{G P(G)}{H P(H)}$$

# Merger Enforcement Decision: General Principles

Suppose equal priors  $P(G) = P(H)$  and ignore enforcement costs

The antitrust authority should challenge the merger if the likelihood ratio satisfies

$$L(\theta) = \frac{P(\theta|H)}{P(\theta|G)} > \frac{G}{H}$$

or if  $D(\theta) = L(\theta) - G/H > 0$ .

Key issues:

Likelihood ratio (whether  $L(\theta)$  is informative)

Ratio  $G/H$

# Merger Enforcement Decision

## Product-to-project mergers

Relatively easy to identify disincentive for innovation from existing profits that are at risk from innovation (Arrow replacement effect)

- $L(\theta)$  is informative

Relatively easy to estimate  $G/H$

Enforcement decision should not depend on probability of success, but may depend on time before project becomes a commercial product because unanticipated competitors can surface in the interim

# Merger Enforcement Decision

## Project-to-project mergers

$L(\theta)$  less informative and  $G/H$  more uncertain than for product-to-project mergers

- Merged company may delay or terminate R&D projects, but merger can have efficiency benefits from complementary activities and knowledge transfers
- Future price effects are more uncertain than for product-to-project mergers because they occur only if both merging parties have successful projects that yield products or technologies that are substitutes for each other



# Merger Enforcement Decision

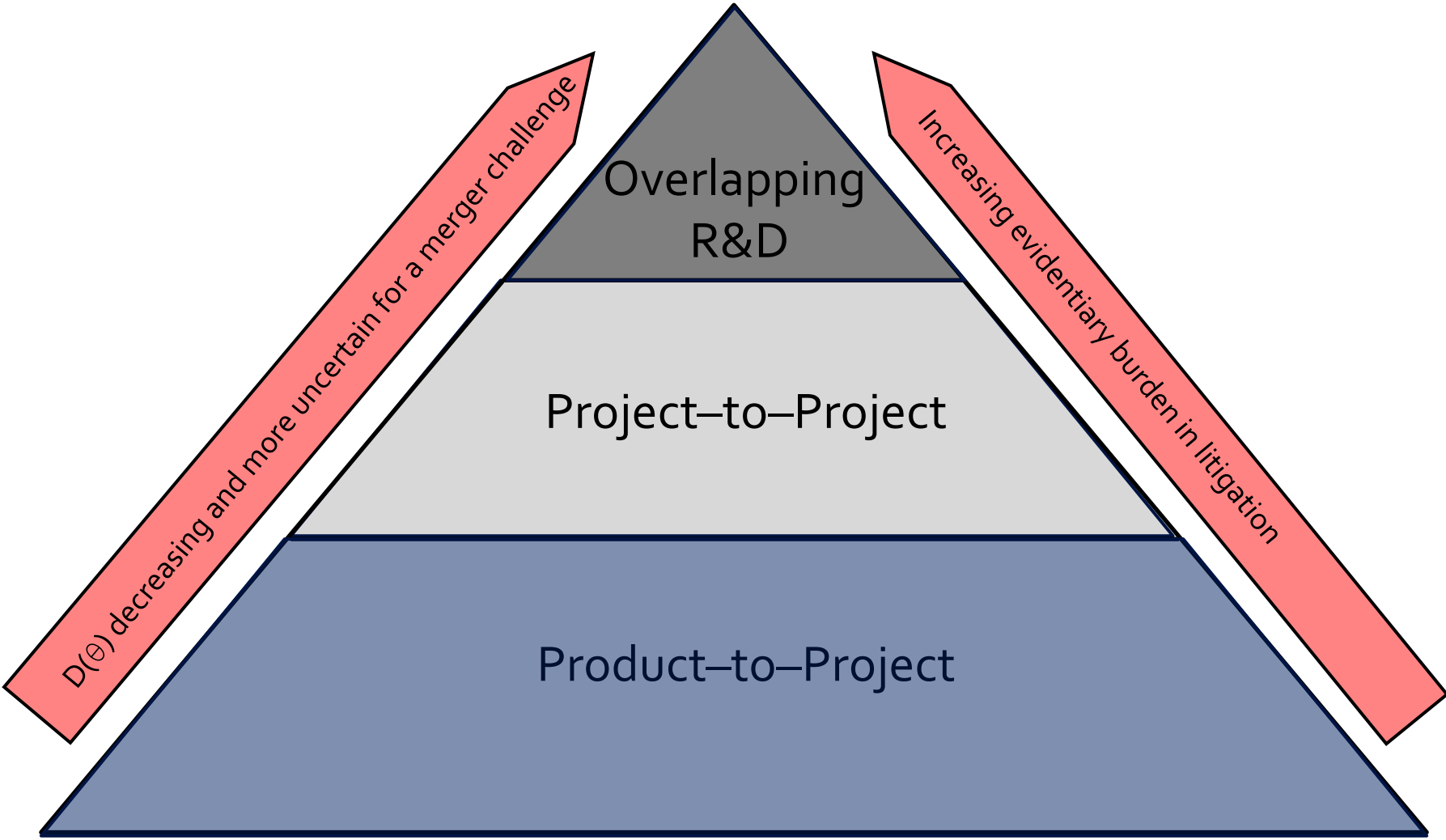
## Overlapping R&D capabilities mergers

$L(\theta)$  less informative than for other types

- Investigations may not reliably predict whether the merging parties would have invested in research and development directed to similar applications and consequently it is more difficult to predict whether they would innovate products or technologies that are substitutes for each other
- Mergers could have efficiency benefits from complementary assets and knowledge transfers

G/H uncertain

# Merger Enforcement Pyramid



$D(\theta)$  decreasing and more uncertain for a merger challenge

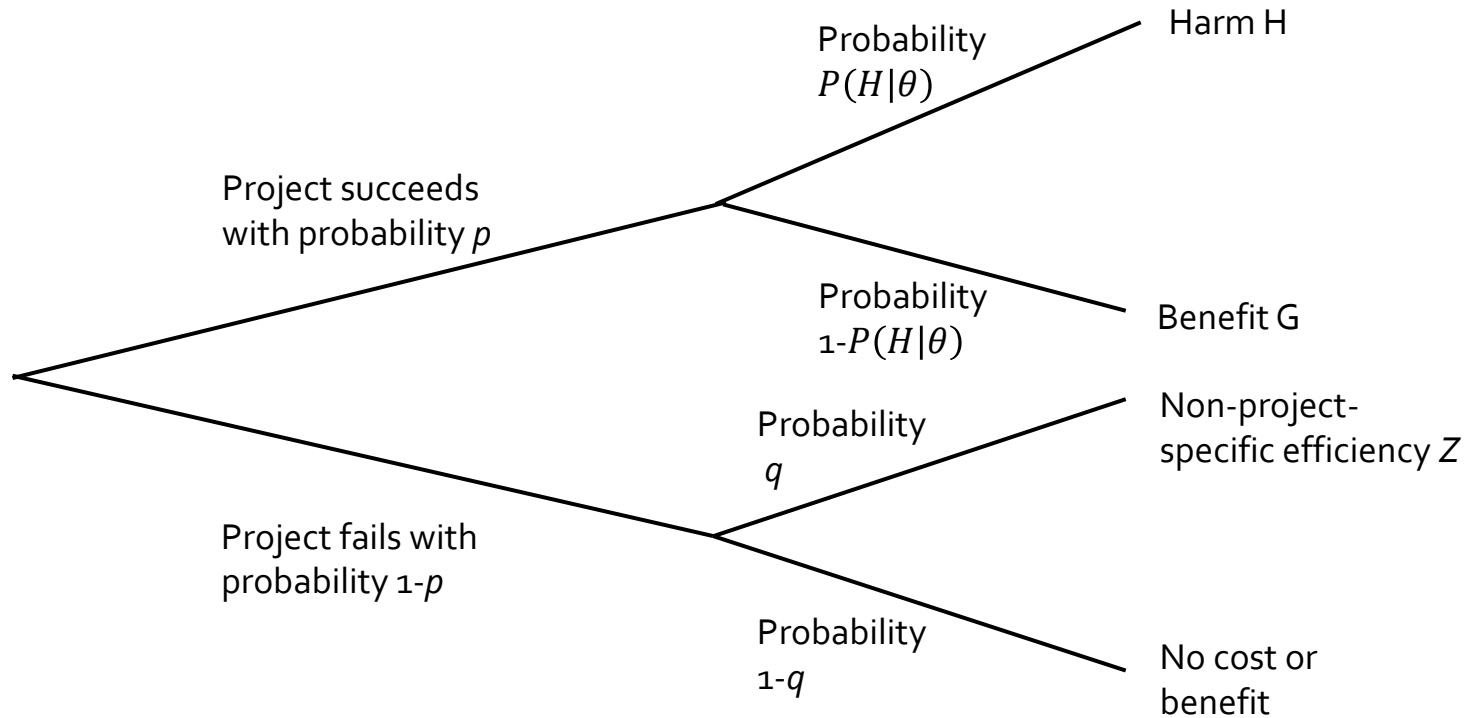
Overlapping  
R&D

Project-to-Project

Product-to-Project

Increasing evidentiary burden in litigation

# Possible Outcomes For Product-to-Project Acquisition



$p$  = probability project succeeds

$P(H|\theta)$  = probability of harm after merger review

$q$  = probability efficiency claims are realized

# Challenge Merger If:

$$EH = p[P(H|\theta)H - (1 - P(H|\theta))G] - (1 - p)qZ > 0$$

If  $Z = 0$  (no efficiencies other than those related to a successful project), the agency should challenge the acquisition if

$$P(H|\theta)H > (1 - P(H|\theta))G$$

This is independent of the project's success probability, although the agency may choose not to incur enforcement costs if the probability of success is small

# Example:

## Thoratec – HeartWare (2009)

“Project-to-product” innovation case for left ventricular assist devices (heart pumps for bridge to transplant or destination therapy)

Thoratec sold the industry leading LVAD (“HeartMate II”). Heartware had a promising LVAD in clinical trials (“HVAD”).

FTC challenged Thoratec’s attempt to acquire Heartware for \$282 million

Medtronic bought HeartWare for \$1.1 billion in 2016

Today, Thoratec (now owned by St Jude Medical) sells the HeartMate II and the HeartMate III (in the EU) and Medtronic sells the HVAD

# Innovation Is Hard To Predict And “Remedies” Can Be Counter- productive

American Home Products-American Cyanamid  
(1995) (become Wyeth)

US Federal Trade Commission conditioned  
approval on divestment of rotavirus vaccine (for  
severe diarrhea) research assets to the Korean  
Green Cross Corporation

What happened?

# ROTAVIRUS VACCINES FROM THIRD PARTIES NONE FROM WYETH (SUCCESSOR TO AHP) OR GREEN CROSS

RotaTeq  
(Merck, 2006)



Rotarix  
(GSK, 2008)



Wyeth/  
Green Cross



# Innovation Is Hard To Predict And “Remedies” Can Be Counter-Productive

Ciba-Geigy/Sandoz (1997) (merger formed  
Novartis)

Gene therapies (Ciba-Geigy 46.5% ownership of Chiron)

FTC: “Sales of all gene therapy products are projected  
to reach \$45 billion by 2010”

FTC required non-exclusive licenses to Rohne-Poulenc-  
Rorer (now part of Aventis)



# Innovation Is Hard To Predict And “Remedies” Can Be Counter-Productive

Ciba-Geigy/Sandoz (1997)

First gene therapy product in 2017

Novartis obtained approval in 2017 for a treatment for leukemia (invented and initially developed at the University of Pennsylvania)

None from Aventis (acquired by Sanofi)

# Innovation Is Hard To Predict And “Remedies” Can Be Counter-Productive

Glaxo Wellcome-SmithKline Beecham (2000)

Prophylactic Herpes vaccine

SKB was in Phase III and Glaxo in Phase II trials

FTC required Glaxo to divest its related assets to Contab  
Pharmaceuticals

No prophylactic Herpes vaccine on the market today  
(some in clinical trials, but none from GSK or Contab)

# Compulsory Licensing Remedies Have Been Successful

No evidence that compulsory licensing has significantly decreased innovation incentives

Compulsory licensing appears to have promoted competition and innovation in some circumstances

- Ciba-Geigy is a good example
  - Compulsory license promoted research into gene therapies
- Many other examples from consent decrees and academic studies of compulsory licensing

# Competition Policy For “Predatory Innovation”

Sounds like an oxymoron, but innovation can have anticompetitive effects

- US v. Microsoft
- Google display bias
- IBM mainframe product designs that defeated interoperability for peripheral devices
- Allegations of “product hopping” in pharmaceutical markets

# Approaches To Analyze Allegations Of Predatory Innovation

- Coercion (“hard” v “soft” switches)
- No-economic-sense test (profit sacrifice)
- Rule of reason

All have flaws, yet each has utility in some circumstances

# Coercion

If a monopolist's products gain acceptance in the market, ... it is of no importance that a judge or jury may later regard them as inferior, *so long as that success was not based on any form of coercion.*

Berkey Photo v. Eastman Kodak Co., US Court of Appeals for the 2nd Circuit, 1979 (emphasis added)

# Coercion: A Flawed Test

Some innovations require firms and consumers to switch to a new product or technology

- A change to IBM interoperability protocols
- Updates to Apple FairPlay encryption
- A change to rankings of organic internet search results

# Coercion: A Flawed Test

Tactics can encourage or discourage technology choices without measures that are explicitly coercive

- Drug companies can “coerce” adoption a new drug by failing to promote the older drug. Drug companies spend more on promotion than on R&D.

Coercion can be pro-competitive

- Markets with network effects can exhibit “excess inertia”
  - May have to exclude inferior technologies to encourage firms and consumers to switch to a superior technology



# No Economic Sense Test (“NEST”)

Conduct (including innovation) that allegedly threatens to create or maintain a monopoly is anticompetitive if, but only if, it makes no business sense for the defendant but for the exclusion of rivals and resulting supracompetitive recoupment.

Related to Ordoover-Willig profit-sacrifice test, but weaker because it requires more than the failure to maximize profits

# Problems With The No Economic Sense Test

Some innovations that have merit make no economic sense unless they exclude competition

“[W]hat’s the point of focusing on making the product even better when the only company you can take business from is yourself?”

Steve Jobs, BusinessWeek, October 12, 2004

# Problems With The No Economic Sense Test

The NEST is generally a very conservative test

- A change to interoperability protocols can have devastating consequences for innovation and competition, yet it can pass the NEST provided that it has some value for the firm that makes the change

The NEST can have the opposite result in some circumstances

- Excess inertia in markets with network effects: exclusion may be necessary for efficient technology adoption

# Rule of Reason

Three-step analysis described in US v. Microsoft

- (1) Does the conduct have an anticompetitive effect?
- (2) If yes, the defendant has the burden to show that it has a pro-competitive justification
- (3) If defendant satisfies its burden, plaintiff has the burden to show that the anticompetitive effects outweigh its benefits

# Problems With The Rule of Reason

ROR can arbitrarily assign anticompetitive harm to exclusion that is the result of a valid innovation

- Innovations harm rivals. Is that an anticompetitive effect?

ROR balancing is hard to do and has never been quantified by a court

- E.g. US v Microsoft:
  - 3 innovations
  - 2 had anticompetitive effects and no pro-competitive justification
  - 1 had pro-competitive justification and plaintiffs did not meet their burden to demonstrate anticompetitive effects
  - No ROR balancing

# Despite Their Flaws, Each Approach Has Value

- Coercion that has no pro-competitive benefit should raise antitrust concerns
- Innovations that make no economic sense other than the exclusion of rivals should raise antitrust concerns

# Support For A “Modified” Rule Of Reason

The ROR comes closest to a true economic welfare analysis

The ROR can incorporate coercion and conduct that makes no economic sense

Innovations can be presumed to pass a “modified” ROR analysis if they have real merit and are not accompanied by other conduct that excludes competition in ways that are unrelated to the innovation’s merits

# A Few Concluding Observations

- There is theoretical support that mergers lower innovation incentives under limited circumstances
- Replacement effects are important if increased by a merger
- Importance of inter-firm and intra-firm spillovers for merger effects



# A Few Concluding Observations

- Empirical evidence relating mergers and innovation is mixed
  - But hard to decipher because analysis is challenging and observations are censored by antitrust enforcement
- Innovation is hard to predict and “remedies” can be counter-productive
- Support for compulsory licensing remedies for mergers and also to address persistent monopolization

# Most Important Antitrust Cases?

Standard Oil divestiture?

AT&T divestiture?

Microsoft cases in US and EU?

Other?

# Most Important Antitrust Cases

1956 AT&T compulsory patent licensing consent decree

1956 IBM compulsory patent licensing consent decree

1975 Xerox compulsory patent licensing consent decree

Stay Tuned For A Discussion Of The  
Google Search (Shopping) Case